# PCB Operation and Maintenance Plan
# Volume 5

## Seaholm Power Plant Decommissioning Project
## Austin, Texas

Revision – 14 January 2013

This O&M Plan covers the operation and maintenance requirements mandated by the U.S. Environmental Protection Agency (EPA) in the *PCB Risked Based Clean-up PCB Conditions of Approval* (EPA, 2003) for the Seaholm Power Plant. The remediation goals mandated in the above approval and accomplished in the subsequent remedial action represent an acceptable level of risk per the EPA.

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# Attachments

# PART 1 – INTRODUCTION

## 1.0 OBJECTIVE

This document is the Operation & Maintenance (O&M) Plan for the decommissioned Seaholm Power Plant. The objectives of the O&M Plan are to serve as a tool during maintenance and construction activities on the Generator Building (GB) and to provide inspection guidelines for the installed polychlorinated biphenyls (PCB) cap. In the GB's current state, exposure pathways for PCBs do not exist. However, potential pathways will be created through maintenance and construction activities that generate dust and/or debris. Requirements in this O&M Plan are not necessary for conducting normal day-to-day building operations. However, if renovation or construction activities are conducted and dust and/or debris is generated, this O&M Plan should be used to address exposure pathways, limits, mitigation, and waste management that will be necessary. This manual is not defining explicit health and safety requirements for specific dust and/or debris generating activities being performed. Qualified personnel (i.e., health and safety officers) must develop a hazard analysis plan for each dust and debris generating activity to determine the proper health and safety, mitigation, and waste management requirements needed.

Decommissioning activities at Seaholm included the removal and/or the encapsulation of PCBs. This document provides the location and potential exposure pathways for PCB areas of concern within the GB and a plan to mitigate possible exposure pathways. Areas of concern are defined as areas in the GB that contain capped PCB-affected material but represent acceptable levels of risk to the general public in their present condition.

This O&M Plan covers the operation and maintenance requirements mandated by the U.S. Environmental Protection Agency (EPA) in the *PCB Risked Based Clean-up PCB Conditions of Approval* (EPA, 2003) for the Seaholm Power Plant. The remediation goals mandated in the above approval and accomplished in the subsequent remedial action represent an acceptable level of risk per the EPA.

## 2.0 O&M PLAN GOALS

The structure of the O&M Plan was developed to meet the following goals:

- Identify areas of concern and current site conditions in the GB;
- Provide mitigation techniques to prevent exposure pathways;
- Provide a maintenance plan (i.e., inspection frequency, inspector certification requirements, etc) for the existing PCB cap; and
- Provide regulatory compliance information for Seaholm site.

## 3.0 ORGANIZATION OF THE O&M PLAN

The O&M manual is divided into four parts.

*Part One: Introduction*

Part One of the O&M plan includes Sections 1 through 5 and is structured to serve as a decision-making and planning tool before work activities that might expose workers to potential hazards in areas of concern if proper hazard mitigation procedures are not used.

Section 5 provides a description of previous remediation activities and current areas of concern according to specific locations in the GB. A chart in Section 6 (Part 2) also provides locations of areas of concern.

*Part Two: Hazard Identification*

Part Two of the O&M plan includes Sections 6 through 8 and is structured to assist the user in identifying current site conditions, potential hazards, exposure pathways, and mitigation procedures. Sections 7 and 8 contain additional sources of information on PCB hazard mitigation and waste management, respectively.

*Part Three: Maintenance Activities*

Part Three of the O&M plan includes Section 9 and serves as a "how-to" manual for maintaining the PCB cap (fiber-reinforced epoxy composite system and concrete) installed in the GB.

*Part Four: Previous Regulatory Compliance*

Part Four of the O&M plan includes Sections 10 and 11 and describes previous remediation efforts and certification of regulatory compliance. Remediation efforts include the decommissioning activities described in the first four volumes of the Closure Report.

## 4.0 HOW TO USE THE O&M PLAN

Figure 4-1 includes a flow chart that consists of a series of steps to follow for the correct O&M procedures. By following the steps in the flow chart, current regulatory information, recommended health and safety requirements, and PCB waste management, including waste accumulation, storage, characterization, profiling, transport, and disposal issues can be identified for specific areas of concern. The affected areas of the GB are listed in Table 4-1.

**Table 4-1. Location of PCB-Affected Areas**

| | **Hazards** | **PCB Capped Area** |
|---|---|---|
| **Affected Area Matrix** | **PCB Covered in Section 7.1** | **PCB Cap Covered in Section 9.0** |
| Generator Building | | |
| *Turbine Hall level* | √ | √ |
| *Mezzanine level* | √ | √ |
| *Basement level* | √ | √ |

Figure 4-1 goes here

## 5.0 REGULATORY BACKGROUND

A summary of the GB PCB regulatory requirements is available in Table 5-1.

**Table 5-1. PCB Regulatory Requirements for Seaholm**

| Material | Regulation | Units | Source |
|---|---|---|---|
| PCBs - floors | 1[a] | ppm | 40 CFR 761.61 (c) |

[a] Per *PCB Risked Based Clean-up PCB Conditions of Approval* (EPA, 2003)
ppm – parts per million

*PCBs*
The manufacture, use, and disposal of PCBs are regulated by the EPA under the authority granted to them by the 1976 Toxic Substance Control Act (TSCA) regulations promulgated in Title 40, Chapter 761 of the *Code of Federal Regulations* (40 CFR 761), which generally bans the manufacture and use of PCBs exceeding concentrations of 50 parts per million (ppm).

In 2003, EPA Region 6 approved the proposed risk-based remediation plan *PCB Risk-Based Clean-Up PCB Conditions of Approval (40 CFR 761.61(c))*(EPA, 2003) for the PCB-affected concrete floor remaining in the GB. This risk-based cleanup plan required the removal of concrete from grids on the GB floor with PCB concentrations greater than 10 ppm. Grids with PCB concentrations greater than 1 ppm after concrete removal were required to have a fiber-reinforced epoxy composite system (PCB cap) installed and demarcated. The 2003 plan also included the requirement to provide this O&M Plan to mitigate potential exposure pathways.

# PART 2 – HAZARD IDENTIFICATION

## 6.0 SITE DESCRIPTION

Characterizations and existing conditions for each of the following areas of concern can be found in the *Seaholm Power Plant Comprehensive Environmental Assessment* (Weston, 1997) and *Phase 2 PCB Remediation Report* (URS, 2005), respectively. See Figure 6-1 for the Seaholm Facility site layout. The only Seaholm building covered by this O&M Plan is the GB. The GB is the only building in the Seaholm Facility to receive the PCB cap. To successfully manage the existing areas of concern, any user of the O&M Plan must be able to recreate the grid system used during the characterization and remediation of the GB. The grid system allows the user to successfully locate the areas of concern within the GB and institute the required exposure controls. Procedures to recreate the grid system, as shown on the figures of the GB current site conditions, are provided below.

## 6.1 Grid System

A grid system is located on the concrete floor of the GB turbine hall, mezzanine, and basement levels.

The northwest corner of the GB is the beginning point (A01) for the grid on all three levels. The grid was constructed by measuring 3-meter intervals trending north to south, which were labeled with ascending, alphabetic letters (e.g., A, B, C, and so on), and 3-meter intervals trending east to west, which were labeled with two-digit sequential numbers (e.g., 01, 02, 03, and so on).

The grid system is described in more detail in the *Response Action Work Plan for Indoor Buildings of Seaholm Power Plant* (Weston, 1998).

The future use of the GB Turbine Hall level may result in the PCB cap being covered by carpet, tile, concrete, etc. The user must be able to recreate the grid system located on the floor of the GB Turbine Hall, mezzanine, and basement levels.

## 6.2 GB Turbine Hall Level

*Description*
The Turbine Hall level is located on the ground floor of the GB. This level of the GB previously housed five turbine generator units and five boilers.

*Historic Contamination and Remediation*
Results from site investigations in the GB indicated that PCBs above EPA action levels were present on the floors and equipment in the Turbine Hall. During decommissioning, PCB-containing equipment and controls and PCB-affected material were removed from the Turbine Hall level.

*Current Site Conditions*
Identified areas of concern remain in the Turbine Hall, including floor grids with PCB concentrations greater than 1 ppm. The grids are marked according to EPA requirements as discussed in Section 9. These areas are capped by a PCB cap. Figure 6-2 shows the locations of PCBs greater than 1 ppm that were capped.

## 6.3 GB Mezzanine Level

*Description*
The mezzanine level is located one floor beneath the Turbine Hall level and was the previous location of the steam, lubrication oil, and fuel piping necessary to run the turbine generators. The mezzanine level also housed several boiler feed and chemical feed pumps.

*Historic Contamination and Remediation*
During site investigations, PCBs were found on the floor, boiler feed pumps, and lubrication oil reserves. Decommissioning activities included the removal of concrete in grids containing PCBs in concentrations greater than 10 ppm and PCB-affected equipment.

*Current Site Conditions*
Remediation of the GB mezzanine level also included concrete restoration and the installation of the PCB cap in PCB-affected areas. All floor areas where concrete removal occurred also received concrete restoration. The PCB cap was applied to all grids that contained PCB concentrations greater than 1 ppm. The grids are marked according to EPA requirements as discussed in Section 9. PCB cap locations on the mezzanine level are shown on Figure 6-3.

## 6.4 GB Basement Level

*Description*
The basement level is below the mezzanine level and previously contained the lubrication oil storage tanks, oil coolers, condensate pumps, boiler feed pumps, and condensers.

*Historic Contamination and Remediation*
PCBs were found in the concrete floor, lube oil coolers, and condensate pumps on the basement level of the GB during site investigations. Decommissioning activities included the removal of equipment and piping on the basement floor containing PCBs, as well as concrete removal on the basement floor and in the sumps.

*Current Site Conditions*
All floor grids that involved concrete removal also received concrete restoration. The PCB cap was applied to all grids receiving concrete restoration as well as any other grids that contained PCB concentrations greater than 1 ppm. The grids are marked according to EPA requirements as discussed in Section 9. The PCB cap locations on the Basement level are shown on Figure 6-4.

Figure 6-1

Figure 6-2

Figure 6-3

Figure 6-4

# 7.0 HAZARDS

This section describes the remaining identified potential PCB hazards. The following sections describe the potential hazards and their exposure pathways, limits, and mitigation for PCB-affected material.

Before performing activities in areas containing PCB-affected material that could create an exposure pathway, the most current PCB exposure scenarios (i.e., information, current regulation, etc.) and exposure pathway mitigation information must be obtained.

The sources for the most current PCB exposure and mitigation information are found in Table 7-1.

**Table 7-1. PCB Exposure and Mitigation Information Sources**

| Source | Web Address | Phone |
|---|---|---|
| EPA | www.epa.gov | 210/ 665-2210 |
| EPA - PCB | www.epa.gov/opptintr/pcb/ | 202/ 566-0500 |
| TSCA | www.epa.gov/region5/defs/html/tsca.htm | 210/ 665-2210 |
| OSHA | www.osha.gov | 512/ 374-0271 |
| NIOSH | www.cdc.gov/niosh | 800/ 35 NIOSH |

EPA – U.S. Environmental Protection Agency
PCB – Polychlorinated Biphenyls
TSCA – Toxic Substances Control Act
OSHA – Occupational Safety and Health Administration
NIOSH – National Institute for Occupational Safety and Health

Possible synonyms for PCBs include polychlorinated biphenyl, chlorinated diphenyl, chlorodiphenyl (54% chlorine), chlorodiphenyl (42% chlorine), polychlorinated polyphenyl, Aroclor 1254, Aroclor 1254, and/or askarel. See Section 8 for waste disposal requirements.

## 7.1 Potential PCB-Affected Area

As described in the previous section, PCB-affected concrete is present in the GB. PCB-affected concrete with concentrations greater than the cleanup level is located in the floors of the Turbine, Mezzanine, and Basement levels of the GB beneath the PCB cap. If construction and/or renovation activities produce any concrete dust or if any concrete debris is created, exposure pathways may be present, and exposure mitigation activities should be performed to address the potential exposure pathways. Table 7-2 describes the exposure pathways and mitigation associated with PCB-affected material.

**Table 7-2. PCB-Affected Material Exposure Pathways and Mitigation**

| Exposure Pathways | Exposure Mitigation |
|---|---|
| Inhalation of Dust | A complete respiratory protection program that, at a minimum, complies with the requirements of OSHA's Respiratory Protection Standard [29 CFR 1910.134] is required. Such a program must include respirator selection, an evaluation of the worker's ability to perform the work while wearing a respirator, the regular training of personnel, respirator fit testing, periodic workplace monitoring, and regular respirator maintenance, inspection, and cleaning. |
| Dermal Exposure (greatest risk) | Protective clothing should be worn to prevent any possibility of skin contact. Chemical protective clothing should be selected on the basis of available performance data, manufacturer's recommendations, and evaluation of the clothing under actual conditions of use. |
| Ingestion | Workers who handle PCB-affected material or enters a scenario where a pathway is present should thoroughly wash hands, forearms, and face with soap and water before eating, using tobacco products, using toilet facilities, applying cosmetics, or taking medication. Workers should not eat, drink, use tobacco products, apply cosmetics, or take medication in areas where exposure pathways are present. |

### *7.1.1 PCB Exposure Limits*

Exposure limits assume that the PCB concentrations measured from bulk concrete floor samples collected during the verification-sampling event (URS 2005) are equal to dust and/or debris concentrations that may be present during construction and/or renovation activities. The highest concentrations were used to perform a PCB risk assessment and determine the most likely exposure scenarios and pathways. Dermal exposure is greatest risk for the exposure pathway during dust- and debris-generating activities in PCB-affected areas of the GB. The following PCB concentration is the highest level that has been reported in the concrete floors at Seaholm. Concrete with PCBs at concentrations up to the maximum shown below is known to remain in the GB. See Figures 6-2, 6-3, and 6-4 for locations.

- GB Concrete Bulk (floors) – 3,020 mg/kg.

## 8.0 WASTE MANAGEMENT

Before handling PCB-affected material, the most current PCB waste disposal information must be obtained. See Table 8-1 for PCB waste disposal information sources.

**Table 8-1. PCB Waste Disposal Information Sources**

| Source | Web Address | Phone |
|---|---|---|
| EPA | www.epa.gov | 210/ 665-2210 |
| EPA – PCB | www.epa.gov/opptintr/pcb/ | 202/ 566-0500 |
| TSCA | www.epa.gov/region5/defs/html/tsca.htm | 210/ 665-2210 |
| TCEQ | www.tceq.state.tx.us | 512/ 239-6300 |

TCEQ - Texas Commission on Environmental Quality

Waste management areas that need to be addressed from the information gathered from the above sources include the following:

- Waste accumulation methods;
- Waste storage limitations;
- Waste characterization methods;
- Waste profiling requirements;
- Waste transportation regulations and procedures; and
- Waste disposal.

The following are waste handling and management guidelines that must be met for any materials and/or debris that are generated during construction or renovation activities within the PCB impacted areas in the GB.

- Potential wastes generated during maintenance and construction activities in PCB-capped areas are known to include PCBs regulated under 40 CFR 761 for which disposal is controlled by federal or state regulations. All federal, state, and local regulations, codes, standards, and permits that apply to the managing, loading, transportation, and disposal of equipment and waste materials must be followed.

- Wastes and materials from grids containing total PCB concentrations greater than or equal to 50 mg/kg in bulk materials must be disposed of at a TSCA-permitted or approved Resource Conservation and Recovery Act (RCRA)-permitted facility. Grid specific PCB concentration can be found in Figures 6-2, 6-3, and 6-4.

- Comply with Department of Transportation (DOT) requirements for shipping and transportation in the Hazardous Materials Regulations of the DOT (49 CFR 171 – 180).

- Obtain all necessary waste codes and approvals from the State of Texas and other entities as necessary for the proper disposal of wastes. Approval to dispose of PCB-affect material from grids with PCB concentrations less than 50 ppm in a municipal landfill by changing the waste classification from Class 1 to Class 2 must be granted from the TCEQ. See Attachment 1 for an example of the approval request and response.

# PART 3 – MAINTENANCE ACTIVITIES

## 9.0 PCB CAP DESCRIPTION

## 9.1 PCB Cap Consisting of Fiber-Reinforced Epoxy Composite System and Concrete

The PCB cap consists of two layers: 1) a combination of high-strength fibers and polymer matrix material used to encapsulate PCB-affected material that contains PCB concentrations above 1 ppm; and 2) concrete poured over the polymer layer. The PCB cap was not required in any other Seaholm building besides the GB. See Attachment 2 for photographs of the installation process associated with the epoxy layer.

### *9.1.1 PCB Cap Location and Description*

PCB cap locations in the GB can be found in Figures 6-2, 6-3, and 6-4, respectively. These locations included grids on the Turbine Hall, Mezzanine, and Basement levels, sumps and trenches, and six turbine pedestals. The PCB cap was identified with a two-color demarcation system, as required by the *PCB Risk-Based Clean-Up PCB Conditions of Approval (40 CFR 61.61(c))*(EPA 2003). A yellow paint layer was applied over the top of the original or restored concrete. The PCB epoxy cap was then applied, and a concrete cap with a nominal thickness of 3.5" will be overlaid to support redevelopment of the GB. A red paint layer was applied over the top of the PCB cap. This system was used so that future workers could identify the location of each PCB cap and the PCB-affected concrete underneath as work is initiated in a PCB-affected area.

### *9.1.2 Potential Failure Modes*

Potential failure scenarios for the PCB cap include:

- Removal of the red and yellow-paint identifying covers;
- Damage to the structure of the fiber-reinforced epoxy composite system;
- Damage to the concrete cap; and
- Failure of the fiber-reinforced epoxy composite system adhesive that secures the composite system to the floor.

### *9.1.3 Operation & Maintenance*

Maintenance of the PCB cap will include an annual inspection of the final flooring material (e.g., carpet, tile, etc.) for signs of any significant damage to the underlying concrete cap. Inspections will be recorded in a maintenance logbook, and any structural damage to the PCB cap noticed during inspections will be repaired immediately. Damaged areas and repair procedures will be documented and reported to the EPA and Austin Energy, if deemed necessary. The manufacturer, installer, and original quality control engineer for the composite components are listed in Attachment 3.

# PART 4 – PREVIOUS REGULATORY COMPLIANCE

## 10.0 SITE REMEDIATION HISTORY

Remediation of the Seaholm Power Plant included:

- Dismantling and removing PCB-affected power-generation equipment from the GB; and
- Remediating PCBs from building surfaces.

Descriptions of decommissioning activities and verification sampling activities can be found in Volumes I through IV of the Closure Report. These volumes include:

- Volume I: *Summary of Equipment Decontamination and Dismantling, Seaholm Power Plant Decommissioning Project* (Weston, 2003);
- Volume II: *Phase I PCB Remediation Report, Seaholm Power Plant* (Weston, 2003);
- Volume III: *Response Action Complete Report Lead-Based Paint and Asbestos Abatement* (URS, 2003); and
- Volume IV: *Phase II PCB Remediation Report* (URS, 2005).

## 11.0 READY FOR REUSE CERTIFICATION

A Ready for Reuse (RfR) application was submitted to the Texas Commission on Environmental Quality (TCEQ) in November 2005. The RfR is used to certify that the environmental conditions at the property are protective of current and anticipated future use based on the successful completion of remedial activities. In January of 2006, the EPA awarded RfR certification for the decommissioned Seaholm Power Plant.

# Attachment 1

# TCEQ Approval Request and Response

# Attachment 2

# Current Site Conditions Photographs

# Attachment 3

# Epoxy Composite System Information